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WESTERN FARMER AND GARDENER.

CINCINNATI, WEDNESDAY, JULY 1, 1846.

NEW ENGLAND FARMER. — This, next to, the oldest paper in the United States, is discontinued. It was begun by T. G. Fessenden, we believe, in 1822; and has reached the close of the 24th volume. The whole set would, we suppose, present the most complete history of the progress of agriculture in the United States, but particularly in the east, anywhere to be found. We are exceedingly sorry that we shall see its face no more.

THE HORTICULTURIST. — The proprietors of the Albany Cultivator have issued a prospectus for a work with the above title to be edited by A. J. Downing. It is a monthly, and devoted to the whole range of gardening, ornamental and commercial. The price will be *three dollars a volume*, in advance.

"*Pomology* — the description and cultivation of fruits and fruit trees, in which we are already more interested than any other people—will be a topic continually discussed. Essays, hints, and designs on ornamental or landscape gardening, will be frequently represented to its readers. The great interest manifested at this moment in many of the States, in the embellishment of grounds and the erection of ornamental dwellings, points out the necessity of some periodical in which these subjects shall be more completely illustrated from time to time. Rural architecture — so closely allied in its nature — will therefore be embodied in the plan of this work, and designs for rural cottages and villas, farm-houses, gates, lodges, hothouses, vineries, &c., will very frequently be introduced into its pages.

Numerous correspondents from among those of ability in the country, will place before its readers a variety of articles on all the most interesting subjects within its scope. A sumary of horticultural news from the leading horticultural journals in England, France, and Germany, will be given monthly. The official reports and transactions of the Massachusetts Horticultural Society, will be regularly published, as well as notices of all the more important proceedings of the principle horticultural societies of this country."

The source from which this work emanates affords the utmost reason for confidence, both as to its continuance (no small matter in these days of new papers and their annual deaths) and its ability. We have no one in America who comes so near being to us what Mr. Loudon was to the British public, as Mr. Downing. We anticipate so able a magazine that, without hesitation, we recommend it to every man ambitious of pursuing horticulture in its higher forms. We will cheerfully act as agent for any that may wish it, and forward their names and money.

WHEAT HARVEST. — So far as we can learn, the prospects are fine. We believe wheat has suffered

little from its ordinary enemies. ☞ *Will our readers who cut wheat drop us a line immediately after harvesting; giving a brief account of their crops and store in their neighborhood?* Do not pass by our request.

IRREVERENT QUOTATIONS.

In the last number of Skinner's invaluable Monthly Journal of Agriculture, a correspondent says, when advocating the practice of *caponizing* fowls:

"We have good authority for asserting the ameliorating influence of emasculation on the flavor of meat; for you recollect the great inspired Psalmist says it is only 'If I were *hungry* I will eat the flesh of bulls, and drink the blood of goats;' and why not apply the same condition to poultry?"

This is a little too bad. We will say nothing of the propriety of quoting a sacred *lyric* to illustrate *caponizing*; we object to the outrageous blunders of which the case in hand is full.

In the first place *Asaph* wrote the Psalm quoted, and not "the great inspired Psalmist," David. But this is a trifle in comparison with the bungling quotation. Let the real language of the Psalm be compared with the miserable trovestie above. In asserting his supremacy and entire independence, God is sublimely represented as saying:

"I will take no bullock out of thy house nor he goat out of thy fold; for every beast of the forest is mine and the cattle upon a thousand hills. If I were hungry I would not tell thee; for the world is mine and the fulness thereof. Will I eat the flesh of bulls or drink the blood of goats?" Ps. 50.

Out of this sublime diction, by which God would teach us his sovereignty, a wretched misquotation is huddled together, as if God was speaking of the castration of animals! We advise the writer, to search out some godly old slave in Calvert county, Md., (where he was born) and procure from him some instruction in scriptural matters. We do not think that the subject of raising poultry, or caponizing roosters, especially requires scriptural illustrations. But if one must interlard his notions with texts, he had better not *invent* them and then swear them upon David.

Modesty.—An ancient poet relates that the flowers once had a grand muster and inspection before Juno, who was to decide which was most beautiful. The violet hid herself among the green grass, and did not offer to contend. When the grand procession of beauties were filing along before the Goddess, the violet peeped out furtively, saying to herself, "I'll just look at them pass." She was seen by the Celestial Queen, and crowned the fairest of the fair. Such is the face of modesty.

COMMUNICATIONS.

DOWNING'S FRUIT AND FRUIT TREES OF AMERICA.

This work, already the most valuable extant, may be greatly improved by proper criticism.—The remarks already begun in the Cultivator, at Albany, by the editor *this* work (the Farmer and Gardener) is very much to my taste thus far. I merely wish to note here a few points which struck my attention on a hurried perusal of the book. The *Large Yellow Bough* "bears abundantly" according to Downing: I think western pomologists report it as a "scanty bearer," "a moderate bearer," invariably. Downing says the fruit is "oblong-ovate;" is such the general shape in the west? The eye also is differently represented in the east and west. *Black Apple*: "flesh yellowish-red:" at this place, a well-marked yellow. If the *Newark Pippin* is "easily known by the crooked, irregular growth of the tree," how shall we know many others which grow "crooked and irregular?" The *Northern Spy* is a "very large" apple in the preamble; in the regular description it is "large;" and the same may be said of the notices of a number of other apples. The index needs a careful revision to correct some typographical errors, as *Compone* for *Pompone*; and to arrange the names *more* alphabetically. There are one or two dozen standard apples of the west which should be inserted; or if inserted under other names, (which I cannot think is true of all,) our synonyms should be given. I will name only our Kirkbridge White—White Astrachan? Gabriel, Carolina Sweet, Carolina June, Daniel Apple, White Pippin—Waxen Apple? Early Red, Pryor's Red, Sweet June, Hoss Apple, Watson's Vandevere, Neverfail or Genneting, (looking like a dead tree in the orchard, when all others are in full bloom;) and of pears, only the Milner's Favorite, a delightful little fruit; and Clapp's Early. Some names in the text, are not in the index. The grub of the *Saperda bivittata*, will never come "out of the tree," nor out of anything else, "in a *butterfly* form," p. 63. J. T. P.

LETTERS OF A COSMOPOLITE---NO. 10.

May 5th, 1846.

Editors Far. and Gard:—Did you ever hear of Hydropathy—the wash and be clean practice, dissolving dirt, disease and death, and giving heart, health, and happiness to the ailing? Brattleboro', Vt., is the centre of this new art, for New England, and a beautiful place it is. If exercise, air and water and perfect freedom from excitement can cure, and my opinion is that they will go further than all medicines and doctor stuff. I am confident that Brattleboro is a ne plus ultra in the matter of locality and natural adaptation. Of the system of treatment, I have no opinion at all. Such notion brings the belief, however, that there is nothing so secret, or strange in the operations of the "water-cure" as to justify all the glorifying that its devotees indulge in. Every intelligent physician, in nine cases out of ten, would prefer to put his patient on to diet, exercise and cleanliness, to drugging them with medicines. But where a patient will not accept this treatment at his hands, he must of course resort to second best. Patients come here to this Dutch doctor, having

tried everything but *nothing*, in the way of medicine, they drink pure cold water, they wash in the exhilarating baths, and then come out with wonder at the sudden strength that enables them to walk a mile or two, when a week before they *thought* they could not walk forty rods; while every hunter or peddlar knows that a thousand times his weary limbs have renewed their strength simply by wading through a stream, or washing in cold water.

Still, I say, success to that innocent humbug, which makes dirty people wash, lazy people work, nervous people sane, overdriven students relax, and bloated epicures come down to healthful diet.

It is funny though, to see the numerous inventions here to be found for the application of this simple panacea-water. The uninnitiated knows nothing of how many different ways he can be wet, or how many ways water can be squirted. And herein lies the persuasive power of this humbug. Common water in a common tub has no power. Oh no! it must be Brattleboro water, and each disease must have a peculiar tub or shower or squirt, and a fat, stupid Dutch doctor must preside over the whole, and be, as the patients all call him, their "water god." He must sweat at unseasonable, bathe at unusual, and walk innumerable hours; and men and women come here who have not for years seen the sun rise, because they were not able to rise themselves, and simply because they are *here*, they consent to wake at half past three and be wrapped in wet sheets, covered with blankets and feather beds, *a la Dutch babies*, jump when they are called to the bath, walk for hours and drink by quarts, and live on the plainest food without stimulous of any kind, and go away *whole*, when had they sense and resolution, they might have pursued the same course with equal success, and far less expense, at their own homes and with their own cheap conveniencies.

Still I repeat the sentiment: Success to Hydropathy, and Dutch doctors.

Putting on my many-league boots, here am I now at Hanover, and old Dartmouth, with a college bell ringing every hour, but alas not for me. The boys run and counter-run; the grave professor moves along the shady walks, book in hand; the gay throng jump and sport over the grass; but I am no longer "one of 'em."

If there is a happy time in a man's life, 'tis during his college course—a period that is never appreciated at the time, but which, the older one gets the brighter it grows. Old mens' eyes never sparkle more brightly or their faces show younger and gayer than when they speed back to college days, and tell of their deeds and misdeeds. You may talk of old soldiers' campaigns, and old sailors' yarns; but I enjoy more, old collegians' reminiscences than all the rest. Tell me truly, now, friend editor, is it not so with thee? I'll not catechise thee; but should I, methinks many a merry story could you tell of college and friends, and many a touching sequel could you add, of the fortunes and misfortunes of your whilome brothers!

The trip from Hartford, Connecticut, up to Hanover, all the road through the Connecticut valley is, perhaps, the most interesting short ride that one can take; at least New England can boast no other such. The throwing together of such fertility and such stony mountains—such greenness and such grayness—such wealth and such poverty—all taken in at a glance, forms the most striking series of pictures the traveller can find, go where he may. As I gazed at the huge granite mountain that uplifts itself just in the rear of Windsor, oh how I longed to transplant it bodily from here to Indiana or Illinois, and give to stony New England a few broad acres of Prairie or Indiana wood-land. Strange it looks to see farm fences with stone posts—wooden houses with slate roofs, and hen-coops, pig-styes and out-houses, all underpinned with eternal granite!

Then the clear stony brooks; the roaring rocky river falls and ripples; the evergreen forests—all new to a western, wonder not if next you hear that that "T. K. B." is "scenery-mad."

Getting off these stilts, let me tell of the uses of the Connecticut river, and of the brawny men that use it—the lumbermen of the north. The navigation of this river above Hartford is limited almost entirely to rafts and small flats, while the numerous rocky falls and artificial dams, render frequent lockage necessary. And even the business of rafting, unlike those of the Ohio river, requires great skill, strength, and local knowledge.

The men engaged in this laborious business, are true yankees in birth, intelligence, and in strength. They spend parts of every year in labor as axemen in the forests 100 miles above here, where the river is a mere creek, wait for sudden torrents to float their logs over places usually dry, to mill; pile up the lumber in rafts, or as they call them, "boxes" from sixty to seventy feet long and thirteen feet wide, and then a company with one pilot, start with from three to seven of these boxes for down, whenever it happens to be just the right "pitch" of water, these rafts of "divisions," at every lock must be separated into boxes, to get through the gates; must be constantly rowed and steered to avoid rock-islands, eddies, currants, &c., so that from thirteen to thirty days are often spent in getting as far as Hartford—less than 250 miles—where, having delivered their cargo, they take stage and make one long "spree" of it all the way home. I had the company of thirty-five of them along the road, and knowing as they did, every hill, stone, tree, and brook, they were rough but acceptable companions.

They are stronger, hardier, and more courageous than our western boatmen, while they are vastly more intelligent, less wicked and disagreeable. They all read and write correctly, and devour newspapers with insatiable curiosity; and many a strong common-sense comment from them can one hear, upon our political course and history. They all *drink* more or less, but are universally polite and courteous—of course, in a rough untutored way. Long shall I remember the lumbermen of "down east."

BOSTON, MASS, May 26, 1846.

In my last letter I touched briefly upon the systematic, intelligent economy exhibited in New England farming, as being gratifying to the eyes of one accustomed to the comfortless unthrifty prodigality of the west. This same superiority in the arrangement and application of capital and labor pervades every other branch of industry and enterprise here, as well as farming. One is struck by the extent to which the distribution of labor and enterprise is carried throughout the community, and the comparative unfrequency, though

by no means entire absence, of monopoly of all kinds in the eastern States.

There seems to be no business in which men of small means may not embark, provided they are intelligent, skillful, and industrious, and thus obtain a per centage of profits equal to those which, at the west, go almost entirely to swell the huge incomes of a few. This has been brought about, by the appreciation of the fact, that in every community there is a very large amount of available resource, which lies useless, because it is *divided*, and therefore inadequate to any great enterprise. Plans *may* be, and here *are*, invented and matured, by which many men of little means, are combined so as to produce results equal to those ordinarily found only in connection with centralized resources. Stages are run by, perhaps, fifty proprietors, over routes whose whole lenth may be less than 100 miles; each subscriber owning, say, 100 dollars; some in stock, some in coaches, and some in mechanical skill, or *drivership*. Railroads are owned often by men who have bought their shares by the labor of a yoke of oxen and the aid of their own hard work. Cotton mills are found, in which the operatives are part proprietors, and draw not only wages, but a portion of net profits. In short, the ability of the province seems to have been studied, and as much of it made productive as possible.

Now in the west, this system, much to our disadvantage, is scarcely known; nay more, any proposal or application of it, is looked upon as little and mean — unworthy of a man. With us there are two ways of living with a small capital. If a man is cautious and safe, he buys his hundred acres for his 150 dollars, and settles down into the steady, sober, saving farmer, whose gains come in slowly but surely; or else, if he be a young man, in haste to be rich, he risks, and wins or loses as the case may be, his all, upon a brilliant unstable speculation, and every time a little man *fails* some big man grows rich.

This is not healthy, either to morals, stability, or prosperity. Yet the outward signs of such fever fits are to be seen all over the west, in rotten rail-roads, empty mills, dingy maps of fine towns, local mud holes, arranged to be connected some time, and then be called a canal. There may be such in New England, but as yet I have met with none, and the general appearance of things here seems to say, that whatever has been deemed worthy of planning and beginning, is worthy of completion.

This much I must say in behalf of New England habits; and so forcibly do they strike me, that I would risk everything I hold valuable, upon the success of that man who *in the west* will hold on to, and hold up yankee industry, yankee shrewdness, and yankee perseverance.

Boston, as a city, is like all other cities—wicked in spots, handsome in spots, busy in spots, but, *unlike* other cities, it is not *dirty in spots*. With every disadvantage, from want of water and breadth of streets, and the existence of countless holes and corners which in other cities would "smell to heaven" with filth as well as crime, yet the streets and walks are all clean and sweet. Even the wharves whence ascends sweet incense from oil, fish, tar, with delightful blendings of bilge-water and dock mud, yet they are to all the other senses clean, and healthy. Such narrow streets are not to be found in the west, unless in the old portions of St. Louis; and such crooked ones are not to be found elsewhere at all. A stranger may know just the direction he wishes to go, but I safely defy any but a "native" to go there by the *shortest* road.

Here again we meet antiquity. In churches we find "Old South" once occupied by soldiery, afterward by horses. "Brattle St. Church, with a cannon ball still sticking where 'twas shot; *Kings* Chapel, besides numerous tokens of age in every cemetery. Cotton Mather's tomb, where he with two brothers had lain more than a century; but older than all, there stands a stone for "somebody" who died 1653, and I have heard of, but not seen, one of 1634.

But the pride of Boston is her rural beauties; within, the common—without, her numerous suburbs, Brookline, Dorchester, Cambridge, Roxbury, and others, which I have not had time to visit. I see them now to the very best advantage, everything being in full, fresh dress of green, mingled and set off by blossoms of fruit, and seeing them I am almost ready to give up and say that I might *here* be pursuaded to live in the country; though even *here* with all the unusual charms I should know how to decide; so great are the attractions of the noisy, busy, city, where life and men are in one continual motion, no chance to rust or time to grow lazy.

Rural architecture seems to have been studied to good advantage; and innumerable are the gems of cottages and villas, set off by little tasty temples, bridges, arbors, and every adornment that art can add to the face of nature, that the unsophisticated stranger can find and admire all around this metropolis of wealth and taste.

But just as "the world was not made in a day," so all the refinements, and tastes, and beauties of civilization are not to be found in the new lands of the west, as yet; not because the taste and appreciation does not exist, but because, there are broad acres yet to clear, and leagues of road yet to pioneer, and herculean tasks of improvement in things useful and essential yet to be accomplished before these tender exotics can find root and support. But when these rough things are once got under, then, as the west already excels the east in many, yes, almost all things, so shall she then stand peerless, and send to benighted yankees, fashions, literature, art, wealth, ingenuity and religion, in return for the nurture bestowed upon our infancy by the maturity of our eastern sisters!

But lest I get to boasting more than is fit, let me cool off a little by descending to matters of fact.

I am disappointed in Bunker Hill monument; it is, to be sure, high enough for all practical purposes; 'tis easy to see from its top, the peaks of the White mountains, and one can look out to see as far as he chooses, and get as much of a breeze as he chooses, by opening the iron windows for a draft; but then, from below, it is not imposing, and so far as I can judge by my eye, is not in actual elevation above the sea, equal to the State House. Nevertheless it is an immense pile of stone, adequate to lay the foundations of many a fine house if you could only transport it bodily to Indianapolis, and withal high enough to make the children ask what it is for, affording opportunity

for a patriotic narration of the deeds of our fathers, which I take it, is the true utility of all monuments—instruments of national education.

Of the Charleston navy yard—of the shipping national and merchant—of the commerce, and commercial advantages of Boston—of its men, and, bless 'em, of its women, I intended to have spoken, but lo, my sheet is full, and I can only, as usual, add,

T. K. B.

REPLY TO T. Z. RAGAN.

PUTNAM COUNTY, June, 1846.

A certain mathematical nurseryman of Bellville, Ia., has, in your last number, taken the pains to examine an article contained in a former number of the Farmer and Gardener, and written by myself.

Passing over his apology for not writing the communication, and his situation on the border of an adjoining State, I shall proceed to notice some of his dissensions from the views of my humble self. He urges several objections to my views which, however, in the end, he admits to be correct. First, the very signature is objectionable—that I can't help now. But worse than the signature is that emphatic sentence, couched in the article—that "*Indiana is an unsuitable climate for pear trees.*" Now, if such an emphatic sentence or sentiment is contained in the article, it is truly very objectionable, nor am I at all surprised that Mr. Ragan should be agitated thereby. For surely it would sound but little worse to talk of a horse being an unsuitable climate, than to talk about Indiana being an unsuitable climate! But, perhaps, he meant to object to an inference which I drew; that is, that the climate of Indiana was, to a considerable extent, unfitted to the successful cultivation of the pear. Though a youth and inexperienced, he says, he begs leave to dissent from Mr. Tyro, or call upon him to exemplify more fully.

Now, my dear sir, I see no need of this; for, indeed, you acknowledge that my assertion "will probably apply to many varieties." To explain my position so that even you may understand me, I will just give the reason that induced me to write on the subject at all. It was not, sir, as you seem to intimate, a desire on my part to discourage and paralyse, but to *give light*. Many were the views offered explanatory to the manner of killing, but no one had the hardihood to come out, and say, that the climate was at fault. This I conceived to be the chief cause of failure in pear orchards, and so urged in the article which you have so horribly mutilated.

You ask me to take a walk with you, when your pears ripen through your young pear orchard. This would be gratifying, but I fear I should not be able to comply. I cannot forget the pleasure it used to give me to enjoy the sweet shade and delicious fruit of trees belonging to your estimable uncle R. Ragan, of this county. But alas! the places that once knew them, will know them no more forever—they *all* sickened and died. As to riding with *us* to the Mammoth Pear Tree, to venerate its ancient trunk and spreading top, at this time, it is out of my power. Nor would the walk among my friend's *young* pear trees, or a pilgrimage to the *ancient* tree, convince me that "Indiana is *in all respects* a suitable climate for pear trees." One tree in a thousand may fairly succeed—all the others may die young. It would be hard to find soil that would push pear trees forward with more celerity than that of Indiana, yet the trees are scarcely known to attain greater age than ten years.

Now what is it that destroys? Answer, Z. S. Ragan. It cannot be a stint soil. Is it the heat of summer, or is it an insect? Neither, you are ready to answer. What then is it? Do you say the severity of the winters? Then I must be allowed to say, in your own phraseology—I must say it "though the heavens fall," that "Indiana is an unsuitable climate for pear trees!!!""

TYRO.

CLEARING LAND.

Mr. Editor:—Having seen a number of valuable articles, in the Farmer and Gardener, on the cultivation of improved lands, I propose to make a few suggestions on the subject of clearing land. The right way to clear land, when time can be taken is, to *deaden* the timber; not *deaden at it*, but *deaden it*. For this purpose, and to effect it in the best possible manner, it should be thoroughly girdled between the first of June and first of September (I speak of what we call *hard* timber;) but from the middle of June to the first of August will commonly be found the best. The timber not only dies the quickest, but rots the quickest; the brush break the quickest, and the timber sooner becomes affected with rot, that a tree or log will burn by itself. Another important item is, the undergrowth; this should be thoroughly cut. There is no necessity for grubbing, if the undergrowth can be cut two or three years before clearing the land, (I except nothing but hazle and sassafras where the timber is very thin,) even sassafras, where it grows among tall timber, if cut off three or four feet from the ground, will die almost as quick as oak. The spice-bush, if cut off just above the ground, when in the shade, seldom ever sprouts.

Again: everybody can perceive that the sooner there is a coat of dead brush lieing on the ground the better is it for the ground; it detains the leaves which fall from the trees and form a coat of vegetable mold, which is of great advantage.

Now for clearing the land; and first of all, let it lie as long as you can, that from four to six years after deadening before clearing, or, if this is thought to be too much delay, try to girdle it that length of time before you want to clear it. This country is very favorable to lieing open; it generally springs up with nimble wild grass, and it is an easy matter to set it in bluegrass, and then there is a first-rate pasture, and this never produces milk-sickness. The best time to burn the timber is in a dry winter when the ground is frozen—then the ground is not injured by burning—at any rate do not burn the ground any more than cannot be avoided. Do not pick up the fine stuff too clean, and never use a rake. Let as much as can of the fine twigs, bark, and small chips be worked into the earth. If they are somewhat in the way the first plowing, don't mind that; if the land is a little too dry they hold the moisture; if it is a little wet, they keep it loose and let the water sink; they help to form a cappillary system which conducts fluids both ways. I would just illus-

trate the impropriety of burning cornstalks and stubble, on the same account.

To illustrate the importance of girdling and underbrushing *thoroughly*, I will relate the following: In 1835, Mr. F., an acquaintance of mine, girdled a piece of timber and hacked some of the brush Mr. M. about the same time girdled another piece about a mile distant, of similar timber on similar ground. Mr. M's timber was rotten and fallen down, without any brush, and the ground covered with grass. Mr. F's would have required two days work to the acre to grub the brush, and much of the timber was only half dead, so that in the end, Mr. F. had to do at least three times as much work to the acre as Mr. M. did, and his ground was not in as good order.

These remarks are the result of practical experience and actual observation. JOHN.

SELECTIONS.

FALL GRAFTING.

Capt. Josiah Lovett, who is distinguished for his success in raising superior vegetables and fruits, has given in the Magazine of Horticulture, his mode of fall grafting, by which he is enabled to get fine fruit from the scions the next season:

Your remarks in the November number of the Magazine, for 1843, page, 423, respecting my mode of procuring the specimens of fruit presented on several occasions at the Horticultural Society's rooms, last autumn, is partly incorrect; they were not procured by budding but by grafting. I have practiced budding with fruit-buds for some eight years past, and occasionally succeeded in getting good fruit from them. It is now three years since I have begun grafting with fruit-wood in autumn, (and I never heard of any person attempting it previous to that time,) thus far I have been eminently successful with the pear and apple, (occasionally with the plum;) the grafts thus set have been more certain to mature their fruit, than the trees from which the grafts were cut; this can only be accounted for by supposing the sap to flow slower in the graft in the spring, in consequence of there not having been a perfect union with the stock in autumn; and the grafts not blooming or setting their fruit quite as early in the tree from which they were cut, escape the injurious effects of our late spring frosts and cold north-east storms, to which, in our climate, we are so subject.

I select a healthy shoot for a scion, with fruit-buds on it; I have them set a foot long with one or two side-shoots. Immediately remove the leaves, and cut on one side in a sloping direction, to a point, the cut from one to two inches long; then with a sharp knife I begin at the point and cut just within the bark, up about half an inch above the commencement of the incision on the opposite side; then select a thrifty upright shoot, on a healthy tree, cutting well back, making a short stump; cut this stump in the same manner as the scion, reversed, and carefully but firmly bush one with the other; secure with bass or Russia matting, and cover with clay; or I prefer to mix equal parts of Beeswax and Burgundy pitch; a less quantity of resin will answer in the room of pitch; soften to a proper consistency with hog's lard, and melt together, and spread on cotton shirting; and then cut in strips of one-half to three-quarters of an inch wide, and after uniting graft and stock, bind with the cotton side next to the bark. The composition ought not to come in contact with the bark, as the bandage should be left on through the winter. If the grafts are carried any distance before uniting to the stock, it will be very important that the leaves be cut off under the tree, and the ends, as soon as possible, dipped in wax or something adhesive.

JOSIAH LOVETT.

Beverly, March 5, 1844.

N. B. The mode of grafting above described, is very similar to what is called whip-grafting by some, though I take much less wood with the bark than I have seen gentlemen do who graft by that mode.

CULTIVATION OF GRASS.—Among the improvements of a few years past, there are none that promise more than those in the cultivation of grass. The peculiarity of this culture, first bro't to the notice of the public by Mr. Phinney, is-that the land is continued in grass, year after year, without the intervention of any other crop, except occasionally Indian corn. Thus far it has succeeded well. It is done by turning the furrows flat, rolling them smooth, harrowing or cross-plowing, or both, without disturbing the sod, applying compost manures and the seed upon the surface and harrowing it in. This process is repeated as often as the land demands a coating of manure. The land is kept in a light and favorable condition for supporting the crops, by the decaying vegetable matter that was upon the surface.

Another modification in the cultivation of grass, which has been successfully practiced by Mr. D. Putnam, of Danvers, and others, is by sowing the seed among the corn at the last hoeing*—taking care to have the ground left in a level and smooth condition. Repeated experiments have shown that the old practice of raising a hill about the corn is not attended with any benefit. If then, the smooth culture of the corn will aid in bringing the lands into good condition for grass, which is the principal object in view—our crops of barley, oats and rye, being raised merely as secondary objects of attention—does it not behoove our farmers to enquire whether their grass-seed cannot be advantageously sown in the summer or autumn, without any intermediate crop of grain?

[**One of the best set fields of timothy we have ever seen, is a ten acre lot on the Canton property. The seed was sown among the corn at the last hoeing. The corn had been tended with the* CULTIVATOR *throughout the season, with the view of keeping the surface flat and smooth, and the seed, after being sown, was* LIGHTLY *harrowed in; this seed took well, and the plants being protected by the corn, grew off finely and covered the entire ground some six or eight inches in height. When the corn was gathered, the stalks were cut close* INTO *the earth, so that no impediment presented itself the ensuing season to the cutting of the grass. The ground was highly manured with* STREET-DIRT *and* ASHES *for the corn crop, broad-cast, and was in the best possible condition to receive the timothy-seed and nurture the plants.*—Ed. Amer. Farmer.]

THE POTATO DISEASE.

MR. J. BRECK—I beg to enclose a translation of the greatest part of a paper read before the Industrial Society (*Societe Industrielle*) of Muhlhausen, the great seat of cotton manufactures of France. If you insert this, I believe the files of the New England Farmer will contain all that is worth knowing on the subject of the potato disease, up to the present day. The observations and the plates accord *exactly* with what I observed and published in the autumn of 1844, and have led to somewhat the same results as to the duration of the disease, and the remedy for it. The plate with figures is at your service, if you wish to give one or two wood cuts. Yours, truly,

J. E. TESCHEMACHER.

Boston, June 9th. 1846.

The following notice of the malady of potatoes, by Dr. Muhlenbeck, was read at the meeting of the *Societe Industrielle*, at Muhlhausen, 29th October, 1845:

My friend, Mr. Leo Lesquereux, stated to me, that in passing through Lisle, he had examined diseased tubers of the potato without finding any fungus. Some days afterwards, he informed me that the disease had appeared at Valde Travers, and that on a careful examination, he had found the Botrytis (fungus) of Morren.

My attention thus called to the subject, I soon discovered some potatoes attacked. I communicated the fact to the President of the Industrial Society, who proposed to form a commission composed of the committees on chemistry and natural history, to watch the progress of this disease, and if requisite, to inform agriculturists of the evil which threatened them, and of the means of guarding against it. * * * * *

Messrs. Morren, Montagne, Lesquereux and Payen, admit the existence of a fungus, which they have placed in the order of *Mucedinea*. Mr. Morren, Professor of Agriculture at Liege, has described this fungus in his excellent memoir on potato disease, and has given it the name of *Botrytis solani*. Mr. Montagne, a learned muscologist of Paris, has called it *Botrytis infestans*. Mr. Decaisne, in studying the diseased tubers, could not find any fungus.

In examining the diseased leaves, I was surprised not to find any of the *Mucidinea*, but a fungus of the order *Mucorinea*. To assure myself of this fact, I hastened to indicate it to Mr. Ed. Hofer, that he might also study it with his excellent microscope of Oberhausser. Drs. Bauer and Weber were kind enough also to accompany us to Morscheviller. On reaching the potato fields, we found one with white potatoes, of which nearly half the crop was affected, while a field of reds adjoining, as yet offered but a few traces of the disease.

Mr. Hofer was kind enough to examine the fungus in our presence, with his microscope, and to draw it with the camera lucida, magnified to No. 350. Mr. Hofer then took some sporules from the leaves, and sowed them on a tuber quite sound in appearance and placed the tuber on a wet cloth; but as at the end of eight days there was no change, he took the cloth away: two days afterwards, a little efflorescence appeared on the exact spot where he had sowed the sporules—and, fifteen days after the sowing, a fungus, perfectly identical with that on the leaves, appeared on the tuber. I examined it with Mr. Hofer, who was kind enough to make a drawing. (*Fig.* 1.)

After four weeks of observations, I can present the following facts.

In examining a potato field still green, some of the leaves have a silvery appearance underneath, which disappears in one or two days, and is followed by the black spot; this spot extends to all the leaves; the stem then takes a yellow color, and at this period the disease, on taking up a plant, one or more of the tubers has a spot rather darker than the rest of the skin. In cutting at this place, a light brown spot is discovered. This tuber exposed to humidity, soon rots, exhaling the fetid odor of decayed fungus. If kept in a dry place, the putrefaction proceeds very slowly, and in both cases, a *mycelium* forms on the eyes of the potato, which passes rapidly to the complete form of the fungus on the leaves.

In examining with the microscope the brown spots of a tuber in which the disease is commencing, there is yet no change in the cellular tissue, which contains the same quantity of starch as the sound parts. As the disease proceeds, the cells change their form, grow longer, and become only filaments crossing each other, without any trace of starch: this is observed in the variety which become watery and hollow without putrefying.

In examining a tuber which has just commenced putrefying, the cells are found deformed, and by degrees they are absorbed: the starch, also changes its form; the grains from being oval, diminish in size, become round, and finally disappear amongst an inedfinite number of animalculæ and of granules, of the size of the sporidia of the fungus. Afterwards, the animalculæ are succeeded by larvæ of insects, and the whole becomes a soft mass.

The mould (fungus) which comes on the leaves,

is the same species as that on the tuber, but the leaves not being so full of juice, it does not there attain a greater height than half a millimetre—[a millimetre is .0371 of an inch]—while that in the potato grows double that size, and in compact tufts, generally on the eye. It is easy to grow that on the leaf of the same size, by placing the upper part of the leaf on water in a dark place.

The microscopic examination shows that this fungus is formed of branches, always bifurcated (forked) which contain a viscid juice, in which granules float. At the extremity of each branch there is a little swelling, which grows into a translucent vesicule, (little bladder.) By degrees, the granules of the stem pass into the bladders, which grow larger as they fill, become pointed, and fall off at maturity, with a small portion of the branch attached. In this state, the sporules (bladders) are

1-100th of a millimetre broad, 2-100ths do. long, and the sporidia which they contain, are round, and their diameter is from 1-100th to 3-100th part of a millimetre.

From these observations, it is clear that this fungus is not one of the *Mucidinea*, and of course not a *Botrytis*, as Messrs. Morren and Montagne have announced; but one of the *Mucorinea*. It is also an undescribed species which takes its place next to Mucor, and to which I give the name *Prichardia*, which I characterize as follows:

Peridium, oval, oblong, pointed; subtrigonal in its dry state, bursting with difficulty, growing at the summit of bifurcated branches, and containing extremely small sporidia.

It grows on the under side of the leaves of the potato, and on the tubers exposed to the atmosphere.

I am persuaded that this fungus alone produces the potato disease; therefore I call the disease *Prichardine*, to distinguish it from the dry gangrene described by M. Martius, and which, according to him, owes its existence to the *Fusisporium solani*; this I therefore shall call, for the same reason, *Fusisporine*.

The potato once infected, loses its vital principle, and drying alone can prevent its decaying.

Having found the cause of the disease in the existence of this fungus, it is, unfortunately, impossible to deny that like the rust and the smut, it will remain permanent amongst us: we should, therefore, endeavor to destroy the germs of it as soon as possible. For this purpose, I propose, with Mr. Morren, to dip the sets in ley before planting, and to powder the stems with lime as soon as they are just above the ground. The cultivator should also burn the tops, as well as all diseased parts, and separate the sound from the diseased tubers before putting them in the cellar, for, as the fungus vegetates on the potato, the disease is propagated after harvesting. Besides, the infected tubers rot quickly, as they ferment; therefore, if put in heaps, it is quickly communicated to the sound ones. It is necessary, then, that they should be well dried, and placed in *light* and airy places; for the fungus being hypophyllous, it is more easily propagated in the dark. In putting them into the cellar after drying, it is well to powder them over with quick lime, to destroy the sporules.—*N. E. Farmer.*

Timber.—At the discussion of the Farmers' Club at New York, interesting as well as important facts are frequently evolved. At a late meeting, a member stated that timber should be cut down in May or June, when the sap is active. He instanced several facts from a paper by Hon. T. Pickering, laid before the Massachusetts Agricultural Society, in 1821, which says that oaks felled in May lasted twenty-two years, those cut in February lasted but twelve years, though exposed under the same circumstances. A farmer in Massachusetts cut a birch for a well-sweep in May, and peeled the bark off. It lasted seventeen years, whereas the birch cut in the winter with the bark left on does not last more than a year. Many other similar cases were enumerated from the paper. He said that timber cut in June should be sawed immediately after it is cut, as it then works easier.

Timber will decay under three conditions: first, by being moist under a free circulation of air; second, when subjected to the action of gases, and shut out from the air; third, in water, when in contact with vegetable putrifying matter. Timber kept dry, in a free circulation of air, would never decay.

Durability of Timber in a Wet State.—Of the durability of timber in a wet state, the piles of the bridge built by the Emperor Trajan, across the Danube, is one example. One of these piles was taken up, and found to be petrified to the depth of three-quarters of an inch; but the rest of the wood was little different from its ordinary state, though it had been driven more than sixteen centuries.

The piles under the London bridge have been driven about 600 years, and from Mr. Bann's observations in 1746, it does not appear that they were materially decayed. In 1819, they were sufficiently sound to support the massive superstructure. They are chiefly of elm.

In digging away the foundation of Old Savoy Palace, London, which was built 650 years ago,

the whole of the piles, consisting of oak, elm, beach and chestnut, were found in a state of perfect soundness; as also was the planking which covered the pile heads.

RUST IN WHEAT.

The extraordinary thriftiness of the wheat crop will be likely to expose it to rust, should there be weather favorable for its production, shortly before the grain ripens. In this event, we are aware of but two measures which can be made use of to save the crop. One is, to cut the wheat as soon as the rust has struck it badly. If the berry is then so far advanced as to be between the milky and doughy state, it will yet fill out, so that but little loss will be sustained. The other method has never, so far as we are aware, been tried in this country, but is said to have been dopted in England with complete success. The following experiment on this point, made by an English clergyman, is published in the Farmers' Encyclopædia:

"It gives me great pleasure to have it in my power to furnish you with some information respecting a use of salt, which, perhaps, you are not aware of. I, and a neighbor of mine, have applied it as a remedy for the mildew in wheat, with the most unequivocal success. I first made the discovery two years ago; my experiments at that time were upon a very limited scale; they have this year extended over only an aker and a half, but under circumstances that leave not a shadow of of doubt of salt being an absolute specific for mildew, in the most aggravated stages of the disorder. Of this I will state to you a convincing proof. In the year 1818, I found a few ears of wheat, which I conceived to be a new and improved variety; from these ears I raised as much wheat as last year sufficed to plant a piece of land four feet wide and 100 yards in length; the produce I had promised to Mr. Coke; and, to augment that produce, I had the ground, previously to planting, highly manured; and as soon as the wheat came up, I gave it a good dressing with soot, and the wheat grew as rank as that sometimes observed upon a dunghill. The mildew made its appearance in this particular of my field, while the straw was quite green, and the grain in a milky state; notwithstanding the danger that might be appreended to the wheat itself, from its being thus succulent, I ventured to give it a dressing with salt and water; and as a heavy shower of rain fell a few hours afterwards, the dressing was repeated the next morning. The proportion of salt to the water, was one pound to a gallon, and applied with a plasterer's brush, the operator bearing a pail of the mixture in one hand, and the brush in the other, making his casts as when sowing grain, or else with a common watering-pot, which, being swung with great force, throws the solution a considerable distance. Two men will go over near four akers aday — the one to spread, the other to supply the mixture. The result was, that the mildew was completely subdued, and the wheat went forward to maturity; and although the sample was not so bold as it might have been, it was sound and marketable. In other parts of the field, where the mildew showed itself, not under the aggravated circumstances described above, but, as it usually appears, the wheat was not in the least injured by it after the salt and water was applied: it was, indeed, as fine a sample as could be grown. Both mine and my neighbor's wheat were examined by many practical farmers, who are so decidedly convinced of the efficacy of my remedy, that they intend never to be without a reserve of salt ready to meet the enemy the moment he appears.

The effect of the salt upon the mildew, to those who do not consider the manner of its operation, is truly astonishing; I believe it to be *instant death to the fungus;* this, however, is certain, in less than forty-eight hours the straw nearly recovers its original color and brightness. The certainty and celerity of its operation I account for thus: the mildew, it is now well ascertained, is a parasitical plant of the fungus tribe, the principal constituent of which tribe is water. When salt, therefore, is applied to them, the aqueous particles are immediately absorbed, and their vitality destroyed. The action of salt upon mushrooms, as in making mushroom catsup, confirms this theory."

The compiler adds: "I can afford decided testimony to the efficacy of the cure recommended by Mr. Cartwright; but I would add these precautions: The safest quantity of salt per gallon of water, is eight ounces, and then the application may be rendered more effectual by frequent repetition, without any danger of injury to the plants. If the application is not made during a cloudy day, it is best to defer it until the evening." — *Michigan Farmer.*

Where wheat is sown broadcast, as we believe it universally is in this country, we do not see how the above named application could well be made to a field. If it could be depended upon to save a crop from destruction by mildew, in that case the trampling down of the wheat by the operators might be of little consequence. Were the salt water known to be so efficacious as above represented, it might be well in sowing to leave intervals for its convenient application. — *N. E. Far.*

PREPARED MANURES AND THEIR EFFECTS ON CROPS.

The substance of the following remarks, which we copy from the American Agriculturist, was lately delivered at the meeting of the American Agricultural Association, in New York, by R. L. Pell.

Mr. Pell rose and said: By analysis it is known that all cereal grains, cruciferous and leguminous plants, trees, and shrubs; require in the soil the same chemical substances, but in different quantities. These are eleven, viz: potash, soda, lime, magnesia, alumina, oxide of iron, oxide of manganese, silica, sulphuric acid, phosphoric acid, and chlorine. If one be absent, the soil will not grow any cultivated plant. Hence, analysis of soils is necessary for a proper and economical application of manure. In a barren soil one necessary ingredient alone might be absent. If, then, ten ingredients be added and the eleventh kept back, the soil is still barren. Hence the reason why so much of New York will not grow wheat, and yet will grow other grain; the requisite quantity of some one or more chemical ingredients necessary for wheat is absent, but in sufficient quantity for rye, &c. When, at last, cultivated plants cease to

grow, the five-finger vine appears, as it requires still less of them. In such a state it is not rare that an expense of three dollars per aker will enable the soil to produce thirty bushels of wheat. I produced seventy-eight and three quarter bushels of wheat on a piece of worn-out ground, by fifty cents worth of two ingredients. Like produces like; and hence if straw of wheat be given to the ground it will produce wheat; indeed, wheat may be grown on a pane of glass, if the seed be covered with wheat straw in a decomposing state. Hence the farmer may sell the grain but not the straw. The farmer who sells straw becomes poor, he who buys it grows rich.

I apply straw to the cattle yard; it absorbs the liquid excrement, and rots. What is long, or partly unrotted, I apply to hoed crops; what is fine I mix with the eleven requisites and apply as a top-dressing. It may be advisable to apply the straw to the ground and plow it in when unrotted. To grow grains, give the soil straw of its kind; for potatoes, their vines; grapes, their vines; to apples, their branches, and so of all. The droppings of cattle are the best manure to grow grasses, as they feed on grass; those of horses fed on grain, for the growth of cereals. Onions are grown year after year, by only returning the tops to the ground. In Virginia, had the refuse of the tobacco plant been returned to the soil, she would not now be barren. The bad farmer is injured by the vicinity of well-manured land, as manure has an affinity for oxygen, hydrogen, ammonia, &c., floating in the air, and attracts them to the provident farmer's land.

Formerly, I applied composts of various things, and had wonderful results. I dared not omit any one, and I knew not which had produced the result. Now, science, by analysis, shows what is necessary. By these composts I grow a squash to weigh two hundred and one pounds, the heaviest on record; and a cabbage to weigh forty-four pounds. By it I grew wheat to weigh sixty-four pounds, rye sixty pounds, oats forty-four and a half pounds. When Sprengel made known his analysis, showing that eleven substances are necessary to all good soils, I found that my compost by chance had them all, and twenty other enriching ingredients.

Previous to 1840, my orchards bore only every other year. Since then I make them bear every year, and this year, (a bad one for fruit,) found my nanured trees full, and those not manured, barren. The drouth this year was fatal to fruit; yet my manured trees had abundant moisture and were fruitful. I prefer the manure of decayed vegetable matter to the excrements of cattle, as the material that makes and supports the animal has been extracted, and the excrement is not so rich on that account. If the vegetable matter be rotted and its ammonia fixed by charcoal dust, all the chemical substances are present. Thus rotted, vegetable matter is more beneficial than the dung of cattle, quantity and quantity alike.

A most valuable manure is the liquid remaining after the boiling of bones. It is very offensive unless disinfected. When hot it is not offensive, but becomes so when cold. It is a jelly when cold. By the application of charcoal-dust to the hot liquid, the jelly when cold is not offensive. In this state it may be made into compost with other substances. In that condition it is a most valuable manure. At present large amounts of the liquid are thrown into rivers. I prevailed upon a grinder of bones to save his liquid by charcoal, and he now sells what he formerly hired carried away. I have used it with great advantage, both on arable and meadow land.

Charcoal is one of the most valuable manures. It is the most powerful absorbent known. It takes from the atmosphere oxygen, hydrogen, nitrogen, ammonia, &c., and holds them while the weather, is dry. During rain it absorbs eighty per cent. of water, and releases the gasses to descend to the earth to fertilize it. When the weather becomes dry it parts with the water, and absorbs from the air the gasses again. This it continues almost perpetually, and it is nearly indestructible. When applied to the earth, the trees, plants, and grasses are found to have it adhering to their roots ready to impart gasses and moisture as wanted. Trees packed in it have remained green for eighty days, while others without have died in like circumstances. Hams and salt meats are preserved perfectly when packed in it. I preserved apples in perfect condition for one year in it. If spread over the compost-heaps, barn-yards, stable-floors, in privies, it absorbs the ammonia, prevents offensive smells, and makes a valuable compost.

Ashes, applied to sandy soils, are valuable; and on some soils, leached are as good as unleached. I have known land too poor to grow eight bushels of corn, made to produce forty-five bushels, by ashes. On sandy soils in grass, they will pay to apply to the aker sixty bushels broadcast. They give to the soil silicate of potash, which is needed to form stems of grass and grain. Muck is made valuable by ashes, when mixed in compost. They destroy the acidity, and fermentation follows.

Lime has been used by me to great advantage. I prefer oyster-shell lime, as it contains no magnesia, which most stone lime does. I put, on barren, worn-out land, 300 bushels of oyster-shell lime to the aker, and it grew wheat weighing sixty-four pounds per bushel. With the wheat I sowed one bushel of clover and half a bushel of timothy seed per aker, and the next year cut two and a half tons, and the second year three tons of hay per aker. I have found it of great advantage in potato culture. They are mealy and fine, and do not rot after gathering, and have been free of rot in the ground.

Bone-dust I have used, and find it most valuable; for soils long cultivated, and destitute of the phosphate of lime, it is the most efficacious manure that can be used. There should be used from twelve to twenty bushels to the aker.

I have used guano successfully and unsuccessfully. Mixed with earth and applied to plants in close contact, it was injurious; applied in weak solution to grass and green-house plants, its effects was wonderful. In composts I have found it very effective.

Night-soil is one of the most valuable manures. In this country, as well as in England, great prejudice prevails against its use, in agriculture or gardening. For ages, it has been used in Asia, and particularly in China. In France, in Belgium, Bohemia, Saxony, all the German confederacy, and Sweden, its destruction or waste, is proqibited by law. As manure, six loads of it have been found to produce 650 bushels of pota-

toes to the aker, while on the same ground, 120 loads of horse manure gave only 480 bushels.

In conclusion, I have to remark that the main stay of the farmer is his barn-yard manure. Yet this varies in quality, according to the material of which it is made, and the manner of making. Thus the droppings of cattle fed upon straw and turneps are far less valuable than those of cattle fed on hay and oil-cake; and it is economy to feed hay and oil-cake, rather than straw and turneps. So in manuring; that which is leached by rains and volatilized by the sun, is less valuable than the unleached and unsunned. But this is too extensive a subject to take up now, and is too well understood by good farmers, to need further illustration.

STRUCTURAL BOTANY

Applied to Horticulture.....Leaves.

Leaves are expansions of bark, traversed by veins.

The veins consist of spiral vessels enclosed in woody fibre; they originate in the medullary sheath and liber; and they are connected by loose cellular tissue which is full of cavites containing air.

This cellular tissue consists of two layers, of which the upper is composed of small cells perpendicular to the outer skin, and the lower of small cells parallel with the outer skin.

These small cells are arranged so as to leave numerous open passages among them for the circulation of air in the inside of a leaf. Cellular tissue of this nature is called *cavernous*.

The skin covering the leaf called *cuticle*, is formed of one or more layers of depressed cellular tissue, which is generally hardened, and always dry and filled with air.

Between many of the cells of the cuticle are placed apertures or pores called *stomata*, which have the power of opening and closing as circumstances may require.

It is by means of this apparatus that leaves prepare the sap which they absorb from the alburnum, or new wood, converting it into the secretions peculiar to the species.

Their cavernous structure enables them to expose the greatest possible surface of their cellular tissue to the action of the atmosphere.

Their cuticle is a non-conducting skin, which protects them from great variations in temperature, and through which gaseous matter will pass readily.

Their stomata are pores that are chiefly intended to facilitate evaporation; for which they are well adapted by the power they possess of opening or closing as circumstance may require.

They are also intended for facilitating the rapid emission of air, when it is necessary that such a function should be beperformed.

The action and functions of stomata being of such vital importance, it is absolutely necessary to the health of a plant that they be not choked up with dust or dirt or injured by insects, the cleaner therefore the leaves of a plant are kept the more it will flourish.

Leaves growing in air are covered with a cuticle.

Leaves growing under water have no cuticle.

All the secretions of plants being formed in the leaves, or at least the greater part, it follows that secretions cannot take place if leaves are destroyed.

And as this secreting property depends upon specific vital powers connected with the decomposition of carbonic acid, and called into action only when the leaves are freely exposed to light and air, it also follows that the quantity of secretion will be in direct proportion to the quantity of leaves, and to their free exposure to light and air.

The leaf therefore is a beautiful contrivance for exposing a large surface of crude sap to the influence of the external air and solar light, by the operation of which it is rendered capable of being converted into different substances required for the growth of the plant and the production of its fruit and seed.

The light of the sun striking on a leaf causes

1. Decomposition of carbonic acid, by which carbon in different vegetable forms enters into the composition chiefly of the solid parts of the plant —this is in proportion to the intensity of the light to which it is exposed; hence, plants grown in the shade are weak, and *vice versa*.

2. Extrication of nitrogen.

4. Insensible perspiration or evaporation; hence this does not take place during the night.

The health of plants depends much on the proper adjustment between the quantity of juices taken up by the roots, and the perspiration of the leaves. If they are exposed to too much solar light, the perspiration is greater than the roots can supply, and the leaves flag: when transplanted, if watered in the evening, the roots become supplied with moisture and juices, the perspiration ceasing during the night, this action recovers its equilibrium, and the leaves are seen erect in the morning.

The quantity of light or shade which can be borne by a plant, depends on the number, form and action of the stomata, and as these vary considerably in different plants, it is evident that some are created to prefer shade, others to prefer light.

In this climate where the atmosphere is so pure and free from mist and vapor, where solar light is so intense during the summer, attention to these principles are peculiarly requisite. On this subject, more will be found under the considerations of light, air, perspiration, and transplantation.

The usual position of leaves is spiral, at regularly increasing or diminishing distances; they are then said to be alternate.

But if the space of the stem called the axis, that separates two leaves, is reduced to nothing at alternate intervals, they become opposite.

And if the spaces that separate several leaves be reduced to nothing, they become verticillate or whorled.

Opposite and verticillate leaves, therefore, differ from alternate leaves only in the spaces that separate them being reduced to nothing.

FLOWERS.

Flowers consist of two principal parts, the interior or those destined to form and perfect the seed, called Stamens and Pistils, and the exterior or those destined to envelope, protect and ornament the former, called Floral Envelopes.

Of these, the latter constitute what is popularly considered the flower; although the former are the only parts that are absolutely essential to it.

Some flowers have only one envelope, some none, as the willow.

However different they may be in appearance from leaves, they are all formed of those organs in a more or less modified shape, and altered in a greater or less degree by mutual adhesion.

The Floral Envelopes consist of two or more series called *whorls* of transformed leaves; of which part is calyx, its leaves being called sepals, and part corolla, its leaves being called petals.

The stamens and pistils are also transformed leaves.

The Calyx is always the outermost, the corolla is always the innermost whorl; and if there is but one floral envelope, that one is called calyx.

Usually the calyx is green, and the corolla colered and more highly developod; but the reverse is frequently the case, as in Fuchsia, Ribes sanguineum, &c.

A Flower being, then, an axis, or stem surrounded by leaves, it is in reality a stunted branch; that is, one the growth of which is checked, and its power of elongation destroyed.

That flowers are stunted branches is proved, *firstly*, by all their parts, especially the most external, occasionally reverting to the state of ordinary leaves; *secondly*, by their parts being often transformed into each other; and, *thirdly*, by the whorls of flower-buds being dislocated and actually converted into branches whenever any thing occurs to stimulate them excessively.

Their most essential distinctive character consists in the buds at the axils of their leaves being usually dormant, while those in the axils of ordinary leaves are usually active.

But an extraordinary case is recorded by Mr. Knight of potatoes growing in the angles (axils) of the sepals and of the petals of the flower.

For this reason, while leaf-buds can be used for the purpose of propagation, flower-buds cannot usually be so employed.

Being stunted branches, their position on the stem is the same as that of developed branches.

And as there is in all plants a very great difference in the development of leaf-buds, some growing readily into branches, others only unfolding their leaves without elongating, and many remaining altogether dormant, it follows that flower-buds may form upon plants of whatever age and in whatever state.

But to produce a general formation of flower-buds it is necessary that there should be some general predisposing constitutional cause independent of accidental circumstances.

This predisposing cause is the accumulation of sap and of secreted matter, as has been before explained.

Therefore whatever tends to retard the free flow of sap, and causes it to accumulate, will cause the production of flower-buds, or fertility.

And on the other hand, whatever tends to produce excessive vigor causes the rapid motion and dispersion of sap, or prevents its elaboration and causes sterility or want of flower-buds.

Transplantation with a partial destruction of roots, age, or high temperature accompanied by a dry atmosphere, training obliquely or in an inverted direction, a constant destruction of the extremities of young growing branches, will all cause an accumulation of sap, and secretions; and consequently all such circumstances are favorable to the production of flower-buds.

But a richly manured soil, high temperature, with great atmospheric humidity, or an uninterrupted flow of sap, are all causes of excessive vigor, and are consequently unfaverable to the production of flower-buds.

There is a tendency in many flowers to enlarge, to alter their colors, or to change their appearance by a transformation and multiplication of their parts, whenever they have been raiseu from seeds for several generations, or domesticated.

The causes of this tendency are probably various; but being entirely unknown, no certain rules for the production of varieties in flowers can be laid down, except by the aid of hybridising.

It often happens that a single branch produces flowers different from those produced on other branches. This is technically called a *sport*.

As every bud on that branch has the same specific vital principle, a bud taken from such a branch will produce an individual, the whole of whose branches will retain the character of the sport.

Consequently, buds by accidental variety may be made permanent, if the plant that sports be of a firm woody nature.

As flowers feed upon the prepared sap in their vicinity, the greater the abundance of this prepared food, the more perfect will be their development.

Or the fewer flowers on a given branch the more food they will severally have to nourish them; and the more perfect will they be.

The beauty of flowers will therefore be increased either by an abundant supply of food, or by both. The business of the pruner is to cause these by his operations.

The beauty of flowers depends upon their free exposure to light and air, because it consists in the richness of their colors, and their colors are only formed by the action of those two agents.

Hence, Flowers produced in dark or shady confined situations are either imperfect, or destitute of their habitual size and beauty.

Double Flowers are those in which the stamens are transformed into petals; or in which the latter, or the sepals, are multiplied. They should not be confounded with *Proliferous* and *Discoid Compound Flowers*. This difference will be explained immediately.

Although no certain rules for the production of double flowers can be laid down, yet it is probable that those flowers have the greatest tendency to become double, in which the parts are habitually multiplied.

Plants whose flowers have naturally numerous stamens and pistils, are those which usually become double, these being the parts generally transformed into petals.

Double Flowers are therefore least to be expected in plants with fewest stamens.

Whenever the parts of a Flower adhere by their edges, forming what are called one sepalled (*gamosepalous*) calyxes or one petaled (*gamopetalous*) corollas, or where the stamens are combined either into one or few parcels, the tendency to multiplication seems checked; but this is by no means general, as we have double Campanula which is one petaled, and double Hibiscus and Camellia where the stamens are combined.

Proliferous Flowers are those in which parts that usually have all their axillary buds dormant, accidentally develope such buds; as in certain Roses, in which a branch grows up from the centre of a rose, or as it is technically said the carpel-

lary leaves develope leaf-buds in their axils, so that the flower becomes a branch, the lower leaves of which are colored and transformed, and the upper green, and in their ordinary state.

Discoid compound flowers are those in which the central florets of a flower-head acquire corollas, like those of the circumference, one side strap shaped, as in the Dahlia; the cultivated varieties of which should be called discoid, and not double.

These two last are so essentially different from double flowers, that whatever laws may be supposed to govern the production or amelioration of double Flowers, can have no relation to proliferous or discoid compound Flowers.—*Teschemacher's Elm Horticult.*

LONGWORTH ON THE GRAPE.

We promised some time ago to give further attention to a pamphlet on the grape and the strawberry, by N. Longworth, Esq., of Cincinnati: we now make some extracts.

"I would here remark, that our European gardeners, do not in general, make the necessary changes, to suit our climate. I have suffered severely, by this adherence to European rules, this season. In my garden I had a most abundant crop of grapes; not a berry lost by frost, or rain, or drouth. But most of them ripen badly, and many of them will shrivel and drop, from cutting off all the tops of the new wood, intended to produce the crop of next season. Had this been done a few days sooner, it would have forced out the fruit-buds of the next vintage. This is done in some parts of Europe, where their seasons are not hot, to ripen the wood, and the leaves are cut off to ripen the fruit. A partial shade, and a free flow of sap, is important with us. In Europe, the south sides of hills are usually preferred. On the Ohio, in a majority of seasons, I believe even a north exposure is preferable to a southern one, and the north sides of our hills are generally the richest." * * * *

"The Isabella succeeds better at the east, than it does wth us.

"The day is not distant, when the Ohio river will rival the Rhine in the quantity and quality of its wine. I give the Catawba the preference over all other grapes, for a general crop, for wine. Sugar was formerly added. The Germans have taught us better. Where the fruit is well ripened, sugar will injure it, where intended for long keeping; where the grapes do not ripen well, I should still add from six to ten ounces of sugar to the gallon of must. It rivals the best Hock, and makes a superior Champagne. The Missouri grape makes a fine wine, resembling Madeira; but is less productive than the Catawba. I have heretofore considered this a French Pineau grape, as it is a delicate grower with us; but I sent some of the plants to my sister in New Jersey, where the soil is poor, stony and stiff. It there grows as luxuriantly as the wild grape of the woods, and is perfectly hardy; and I now deem it a native. I obtained it of Messrs. Prince of Long Island, twenty-five years since. The berry is small, the bunches of medium size, berries free from a hard pulp, and very sweet. The Herbemont is a fine table grape, and makes a fine wine; but is subject to rot. The Lenoir much resembles it, if not identical, which some consider it. I do not. The Ohio is a fine table grape, bunches much larger than either of the former; but experience does not enable me to recommend it highly for wine. It has a peculiar flavor, and resembles a foreign variety I have heard highly lauded, but does not suit my taste. The Bland is a bad bearer: does not ripen well, nor make a good wine, but is a fine table grape. I do not believe it a native grape. Gen Harrison informed me, that it was introduced into Virginia sixty years since, by a French gentleman of the name of Mazzei. The Elsinborough is a good table grape, and free from a hard pulp. Norton's seedling is far inferior as a table grape, to the Herbemont, Ohio, Lenoir, Elsinborough and Missouri, which it resembles in the size of its fruit. It has a pulp." * *

"The grapes at the vinyard of Mr. Rents would have ripened better, had one-third of the bunches been cut off early in the season. Where the crop is very abundant, it requires a very favorable season to ripen the fruit well.

"Six hundred and fifty gallons to the acre, is a large yield, and the season must be favorable, or they will not ripen well. A large crop is often occasioned by leaving too much bearing wood. This should always be avoided; for even if the crop ripens thoroughly, too much of the sap is taken by the fruit, and too little left to produce good young wood for the next season's crop.

* * * * *

"I have for thirty years experimented on the foreign grape, both for the table and for wine. In the acclimation of plants, I do not believe; for the White Sweet Water does not succeed as well with me, as it did thirty years since. I obtained a large variety of French Grapes from Mr. Loubat, many years since. They were from the vicinity of Paris and Bourdeaux. From Madeira, I obtained six thousand vines of their best wine grapes. Not one was found worthy of cultivation in this latitude, and were rooted from the vinyards. As a last experiment, I imported seven thousand vines from the mountains of Jura, in the vicinity of Salins, in France. At that point the vine region suddenly ends, and many vines are there cultivated on the north side of the mountain, where the ground is covered with snow the whole winter, from three to four feet deep. Nearly all lived, and embraced about twenty varieties of the most celebrated wine grapes of France. But after a trial of five years, all have been thrown away. I also imported samples of wine made from all the grapes. One variety, the celebrated Arbois wine, which partakes slightly of the Champagne character, would compete with our Catawba." * * * *

"I have heretofore wanted faith in the doctrine of French Horticulturists, that to improve your stock of pears, you must not select the seed of the finest fruit, but of the natural choak-pear. I am half converted to their views. The Catawba is clearly derived from the common Fox grape. In raising from its seed, even white ones are produced, but I have not seen one equal to the parent plant, and in all, the white down on the underside of the leaf, and the hairs on the stock, common to the wild fox grape, are abundant.

Too little attention is paid to the collection of our native fruits. Grapes of a fine quality, both for the table and for wine, are occasionally found

in most parts of the country, and all our old citizens speak of the choice grapes known in their boyhood, that have now disappeared. The late Mr. Herbemont of South Carolina, forty years since, resided in the vicinity of Pittsburgh, where he found a grape in the woods, equalling, as he assured me, the best grapes of France. Twenty years after, he travelled from Carolina to Pittsburgh, to obtain that vine. When he reached the spot, he found the ground cleared, and no vestige of the plant remaining. All our early settlers in this region, speak of a delicious grape that grew at the head of Loughrey Island, about thirty-five miles below our city. In the grape season, families on the river for many miles, went there to gather the fruit. They were growing in the drift-wood at the head of the Island. And old codger, who had an idea that a large quantity of iron was mixed with the drift-wood, put fire to it, and destroyed the vines; and finding no iron, concluded it was burnt up with the wood. I have never been able to learn that any person preserved this variety." * * * *

"It has been considered a settled principle, that good wine cannot be manufactured in the United States. We have this prejudice to overcome, and the quality of our wine will not of itself, always enable us to do it, Two strong instances occur to my mind, that happened in our city. A gentleman in our own city, in whose judgment in wines great confidence was placed, could never be induced even to taste our domestic Hock, tho' a great admirer of the imported article. On two or three occasions I knew him to take a glass, and praise it highly; but the moment that a smile from the host told him of his error, he backed out, *readily discovered* his error, and could not be inkuced to make a further trial. But on a certain occasion a friend invited him to dine with him, and drink a glass of superior Hock, recently sent him as a present. The bait took—the gentleman praised the wine highly, and pronounced it equal to any he had ever drank, and proved his sincerity, by not leaving the table till he had two bottles under his belt; and for the next month, never met his host, without enquiring if all his fine wine was gone, and expressing a great desire to give it a second trial. After he was fairly committed, he was told that it was the native Catawba. From that day he knocked under, and acknowledged his prejudiced had blinded him. The other. The other, was a comparison of domestic wines from our different vinyards, by a dozen of Hock drinkers, selected for the occasion. The gentleman who acted as chief of the judges, was a great admirer of the Spanish Mansinaella, and with a view to cheat the company, I slipped in a bottle of his favorite beverage. Whilst his brethren were tasting the wine, and expressing their opinions, their leader silently tasted each bottle, but said not a word, till he had tasted the whole. He then remarked, he 'should reserve his opinion as to the best bottle; but he would promptly decide which was the worst bottle on the table,' and placed his hand on the Mansinaella. I told him I concurred with him in opinion, but that he might change his, when advised it was his favorite Spanish wine, and from the same cask that he had always pronounced a superior article.

To insure success, we must observe great care in selecting the fruit. Select good sweet casks, and use cleanliness in expressing the juice, and skill in the process of manufacture, and preservation of the wine. Keep it in a cool cellar, dark tight, and carefully rack the same yearly, till the wine is perfectly fine, and fit for bottling. For wines that have no alcohol added, require tight casks and cool cellars, to keep them sound. They are less subject to run into the acetous fermentation with us, than they are in France and Germany. To the ropiness of which they complain, our wine is not subject. It is a common saying in France and Germany, that, 'a poor man cannot make good wine.' The reason is obvious. The Rich man not only has more influence in obtaining favorable opinions but he also uses more care and skill in the manufacture. The poor man must sell his wine as soon as made. The rich man retains it till it is improved by age, and never sells any under his own name, but that which proves to be of superior quality. The vintage of bad years, is sold without a name. So much depends on manufacture and reputation in Europe, that wine from the same variety of grape, and the vines divided by a footpath in the same vinyard, have very different reputations. The one will bring $18 per dozen, where its neighbor will not command $3. Many commence the manufacture at the lowest price, and in a few years by great care and skill command the highest.

"The reputation of particular vinyards changes with the tenants. On the bank of the Ohio, two miles below our city, I yesterday saw some Germans at work, trenching, banking, and walling, one of the most steep, rugged, and stony hills in the country. To have hired the work done by the day, would have cost from $300 to $400 per aker. When completed, it will be a lovely spot. The cost to them is a trifle, for the work is done during the winter, when they have no employment. They raise their own hominy and sour-crout. And it will not be a serious loss if they occasionally partake of a quarter of lamb, and they can by it at ten or twelve cents per quarter.

PHILADELPHIA BUTTER.

ITS HIGH FLAVOR AND THE SOURCE WHENCE THIS IS DERIVED.

To the Editor of the Farmers' Library:

My Dear Sir:—During one of your late visits to Philadelphia, we had some conversation relative to the rare qualities of Philadelphia butter, which, though good at all times, is at one season distinguished by a peculiarly high and delightful flavor, not to be found in the same degree, so far as I can learn, in any other part of the Union. I told you that I thought I had discovered the source of this peculiarly grateful flavor, and now undertake to redeem a promise made to write you on the subject.

In the first place, I wish you to bear in mind, that the original settlers in the old countries adjacent to Philadelphia, were chiefly from Wales, and hence may claim a legitimate right to excel in the processes of the dairy. They took up their abodes among the hills, and as indispensable appendages of their farm houses, built what they called "spring houses," over the natural fountains flowing out of the hill-sides. These are shaded by wide-spreading trees tending to preserve the

coolness imparted by the water surrounding the vessels containing the milk, cream, and other dairy products. A temperature is thus secured for the cream established by experiments as the most favorable to the perfect operation of churning, namely, the range from 50° to 65°—beginning with the cream at or near the first named degree, and terminating the process with the temperature at 65° It is only after the butter has "come" that warm water is to be added so as to raise the warmth to 70° or 75°. This is to facilitate the separation of the butter from the milk. No one who has ever visited Pennsylvania spring-houses and observed the coolness and cleanliness they usually display, can doubt the great advantages afforded by them for dairy purposes.

But, though these circumstances may serve to improve the general qualities of Philadelphia butter, still they are by no means concerned in producing that delightful flavor, the immediate cause of which is the main point to which I now wish to call your attention. As before intimated, it is only at one season that the flavor is in greatest perfection, and hence our housekeepers call it "May butter," and sometimes "grass butter." The limits of the season of highest flavor may be set forth about the middle of April to the middle of June. Now it is precisely during this time that the old, unplowed meadows and pasture fields in the vicinity of Philadelphia abound with a species of grass so highly odoriferous as to have obtained the name of *Sweet-scented Vernal Grass.* Botanists call it *Anthoxanthum odoratum.* The scent somewhat resembles that of vanilla. It grows about a foot or eighteen inches high, rising above the surrounding grass. Its stem is very small and round, with a few long and slender leaves. Its odor will alone be sufficient to distinguish it from all other grasses found in our pastures. When in blossom, the air is often highly charged with its scent, and at this time I seldom ride into the country without gathering a handful of the grass to enjoy its rich perfume at leisure, and perhaps store it away in a drawer. And it is so very forward in its growth, so does it show the earliest signs of decay. About the middle of June the fields and meadows where it abounds assume a yellowish appearance from the dying of the stems of the first growth. The cattle press these aside to get a greener herbage, and now the high flavor of butter declines.

The Sweet-scented Vernal Grass is a native of Europe, whence it has doubtless been introduced into the vicinity of Philadelphia, blended probably with other grass seeds. It has long become naturalized, and now occurs among other spontaneous herbage disputing the right of soil with the common green grass, and never yielding possession till turned under by the plow, after which it clings to the unbroked fence and headrows. Tho' seldom, if ever regularly sown here, it constitutes a part of the growth of most English pastures, thriving in nearly every kind of soil. The sweet odor for which the English meadow hay is so noted, comes from the admixture of this grass. It is, however, seldom, if ever sown by itself, but usually mixes with the seed of other grasses adapted to the formation of permanent pastures. It ranks rather low on account of nutritious qualities, but is principally esteemed for its early growth, and continuing to throw up fresh shoots till the end of autumn. Indeed, the aftermath, or second growth, is particularly prized for grazing purposes.

A chemical examination of the Sweet-scented Vernal Grass, shows that while its nutritious properties are less than those of most other grasses, it is distinguished from those by containing *benzoic acid, or flowers of benzoin,* a substance possessing a peculiarly agreeable aromatic odor. An essential oil in which this resides can be distilled from the grass, affording a pleasant perfume. It is undoubtedly this aromatic ingredient that imparts to the milky secretion of the cow, the flavor so pleasantly manifested in Philadelphia Spring-grass butter. When we find milk so readily imbued with the peculiar flavor of garlic, turneps, and other substances upon which cows often feed, there can be no room to doubt that a fragrant grass freely eaten by cows, should likewise impart its particular flavor to the milky secretion.

If this very simple solution of the cause of the high flavor of Philadelphia spring butter be true—and I have not the least doubt upon the subject, you can at once perceive that a pasture grass may be introduced almost everywhere, which will communicate an exquisite flavor to butter.

London, Epping, and Cambridge butter is greatly extolled. The cows producing the former, which is most esteemed, graze during summer in the wild pastures of Epping forest, and the high flavor of their butter has been commonly ascribed to the wild shrubs, plants, and leaves of trees upon which they feed. The Cambridge butter is also produced from cows that graze upon natural pastures, one part of the year on uplands, and the other in rich meadows. As the Sweet-scented Vernal Grass is common to the natural pastures of England, I doubt not it may be found most abundant in those of Epping, Cambridge, and other places most celebrated for high-flavored butter. So far as I can find by inquiry and research in English books, the particular grass which contributes the greater part, if not all the fine high flavor to the best and most costly butter, has never as yet been identified. Without such exact knowledge, this flavor of butter necessarily remains beyond the control of the agriculturist, wherever nature or accident has not provided the pastures with the aromatic agent.

I remain, very respectfully, yours, &c.,

G. Emerson.

INTERESTING STATISTICS.

Among the many blessings attendant upon improvements in the social condition, and the advances of our race in intelligence, is the prolongation of human life. With the increase of intelligence is the prolongation of human life. With the increase of intelligence, has grown up a knowledge of the elements of health, and a regard for them; and, commensurately with the strides of science, have we acquired the means of arresting disease and averting its ravages. The statistics of all civilized countries, showing a gradual lengthening of life, prove the correctness of our assertion; and in the United States, additional causes render this fact even more certain, if need be. In France, the average age of one million of persons who died before the Revolution was twenty-eight years and

ten months. In the Annuaire, for 1831, Mathieu gives, as the average age, thirty-one years and six months. In one century — from 1728 to 1828 — the average age of persons dying in London increased four years and nine months. In Geneva there has been a constant increase of this average age for nearly three hundred years, during which time it has nearly doubled. In 1560 it was twenty-one years and two months and twenty days; in 1833, forty years eight months and seven days. The test which statistics generally furnish in this point is the per cent. of annual deaths among the numbers of the living, which, in most countries, has uniformly diminished within the last century.

It is exceedingly instructive to observe what constant and well-definable laws large bodies of people observe in living, dying, or in undergoing any change. The census of 1810, compared with those of 1820 and 1830, furnish an interesting view of the relative increase of age and the prospects of age in the United States. The following table, derived from the returns of those years, exhibits the average increase over forty-five years of age, first in aggregate, and then as to particular States, selected at random:

	1800.	1810.	1820
United States - -	34.3	35.3	36.8
Virginia - - -	32.7	36.1	36.8
Massachusetts -	49.2	50.7	54.4
Connecticut - -	49.9	54.	59.2
North Carolina -	29.6	31.2	33.7
South Carolina -	27.4	28.5	32.6
Ohio - - -	20.9	25.7	28.3
Mrine - - -	29.9	32.2	38.9
New Hampshire -	38 3	42.4	51.9
New Bork - -	31.8	32.6	36.5
Rhode Island - -	49.1	51.6	50.9

The facts here presented show, most conclusively, that the population of the United States are living under influences tending to increase the length of life.

Another striking fact is presented from the same sources, that a much greater proportion of our people die in the early and youthful periods of life than in any part of Great Britain or Europe. This may be referred to two causes: first, to the influence of emigration, which brings to our shores a large preponderance of the youthful; and, secondly, to the greater relative proportion of births in the United States. The first of these causes is just as we might expect to find it; the other is readily accounted for upon a law of population — that it increases as the facilities of living increase. It is a proverb, "Where a loaf is added, a man is born." Hence we observe that the more recent the settlement and growth of any State, the greater the ratio of population below the meridian of life, and the greater the *increase* of ratio in advanced life.

A practical review of population in our States presents the gratifying fact that not only are the people of this country foremost in the great works of human progression and enterprise, but that they cultivate in an eminent degree also the integral elements of happiness, which add much to the economy of life. Within the compass of our Union we have nearly all varieties of climate and as many of topographical sections. We have, therefore, the means of testing, to its fullest extent, the effects of habits of life and condition upon the duration of existence. The results, as time develops them, must ever prove of interest.

Phil. Chron.

Cabbage Sprouts. — Very few people take half the pains they ought with cabbages. When they are cut—no matter how — the stumps are left to bring sprouts; no matter when, nor how many. Now, the fact is, that when the sprouts begin to come, they should all be rubbed off but the best— or at most, two; instead of which, a multitude of small ones are allowed to grow, not any of which bring good hearts, and all are, for the most part, but a poor apology for greens. When a cabbage is cut, the leaves should be cut off the stem, and as soon as the buds of the stump begin to grow, rub off or cut all that are not wanted, leaving one of the strongest and best to grow into a head, in which it will do in an incredibly short time; equalling, and more frequently excelling the first head itself, in flavor and appearance.

Far. Mon. Vis.

To Cure Galls in Horses. — W. B. Hamilton, of Philadelphia, says: "Some twenty-five years since, an old stage-driver told me the secret why, to the astonishment and envy of every other Jehu, his horses were never galled. Myself and friends have tested it again and again. Here it is. Gather a quantity of smart-weed (*aqua piper,*) which grows in almost every wet spot; bruise it well and put it in an iron vessel; cover it with chamberley, and wash the galled places whenever the horse enters or leaves the stable, or oftener, and the cure is almost immediate. If badly galled under the harness or collar, bruise well some of the leaves and bind on the spot."—*Exchange.*

To make hard water soft — add to one bucket of water, warmed, one ounce of carbonate of soda, which renders it soft as rain and water.

CONTENTS OF THIS NUMBER.

New England Farmer, Wheat Harvest, 193
Irreverent Quotations, Modesty, Downing's Fruit and Fruit Trees of America, 194
Letters of A Cosmopolite, 194, 195, 196
Reply to T. Z. Ragan, Clearing Land, - 197
Fall Grafting, Cultivation of Grass, - 198
The Potato Disease, - - - - - 199
Timber, Durability of Timber in a Wet State, - - - - - - - - 200
Rust in Wheat, Prepared Manures and their Effects on Crops, - - 201, 202
Structural Botany, - - - 203, 204
Longworth on the Grape, - - - 205
Philadelphia Butter, - - - - 206
Interesting Statistics, - - - - 207
Cabbage Sprouts, To cure Galls in Horses, To make Hard Water Soft, - 208

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